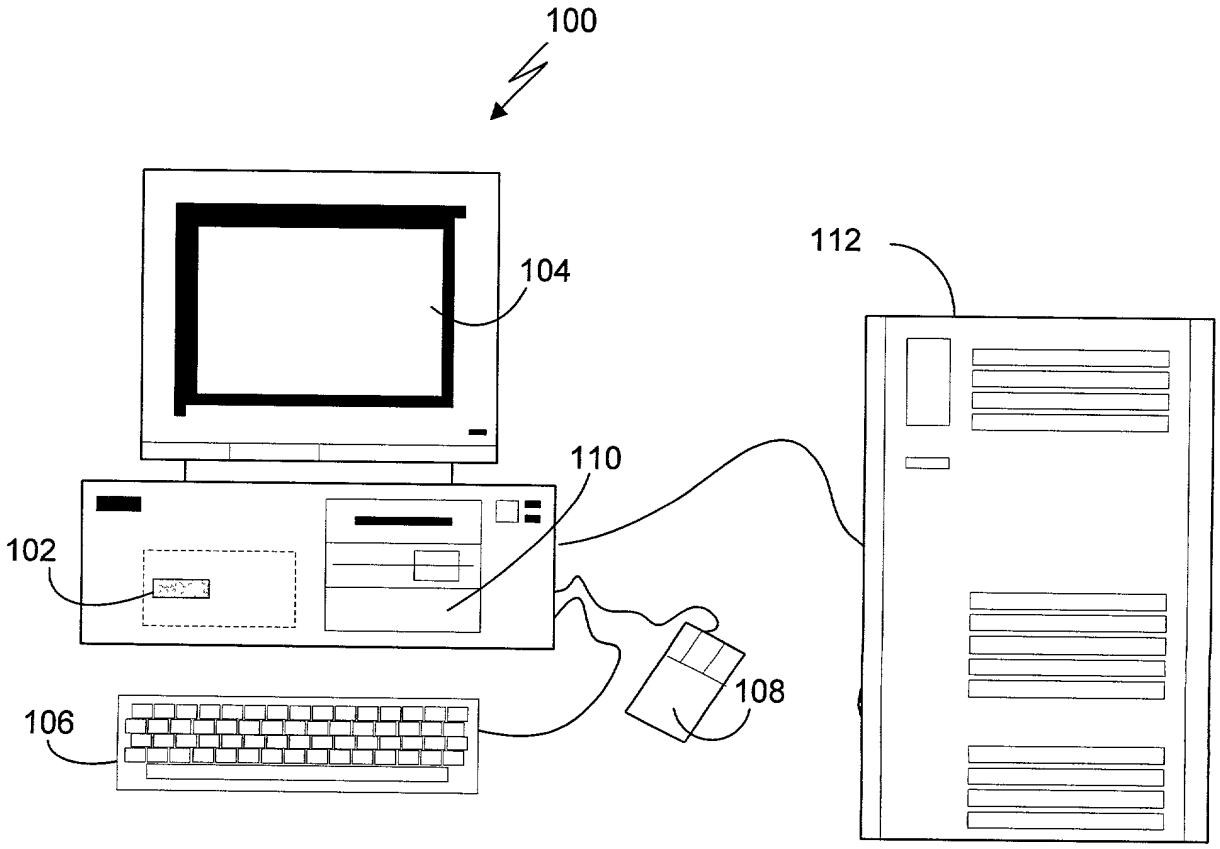


Fig. 1

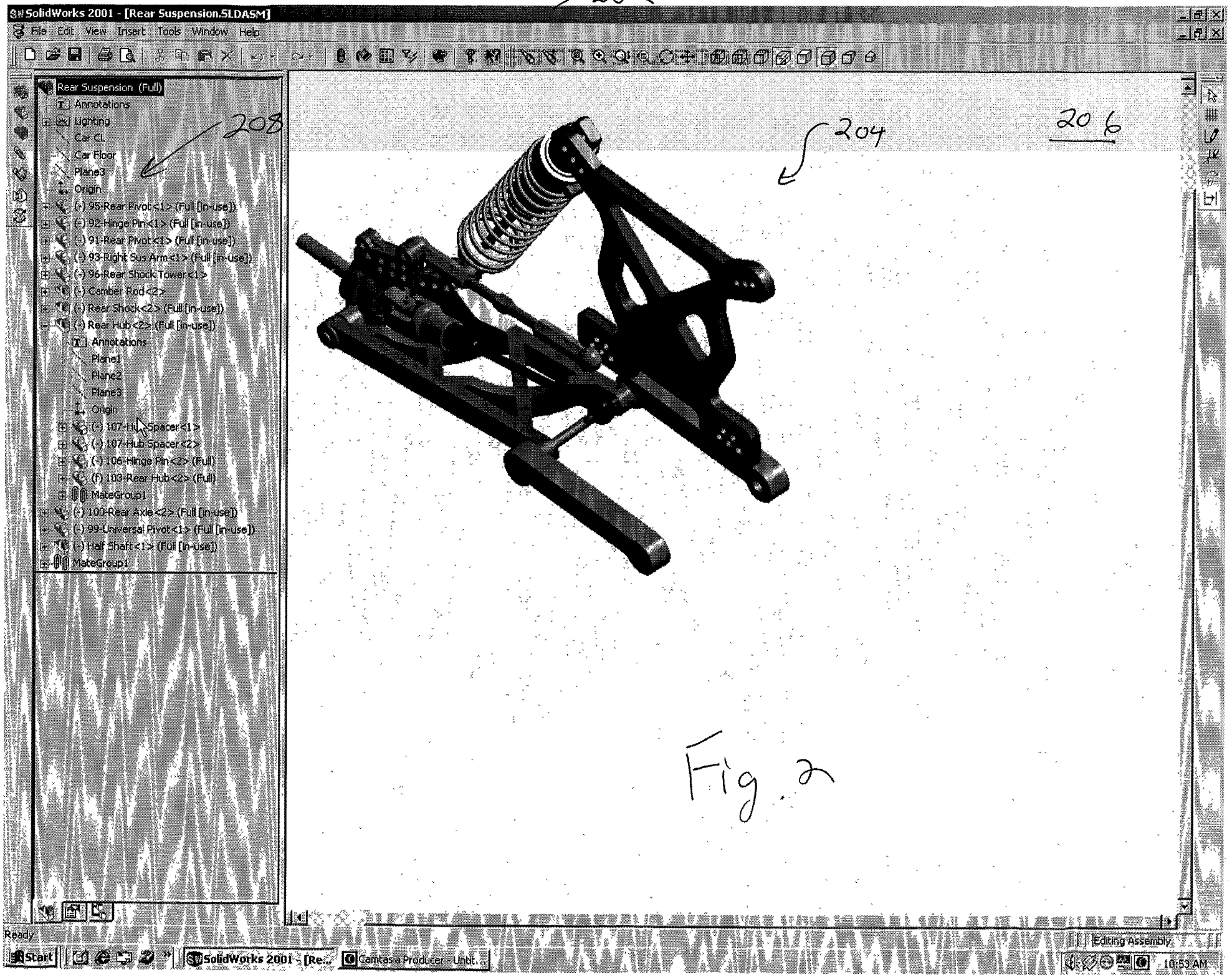

SolidWorks 2001 - [Rear Suspension.SLDASM]
File Edit View Insert Tools Window Help
Rear Suspension (Full)
Annotations
Lighting
Car CL
Car Floor
Plane3
Origin
(-) 95-Rear Pivot<1> (Full [in-use])
(-) 92-Hinge Pin<1> (Full [in-use])
(-) 91-Rear Pivot<1> (Full [in-use])
(-) 93-Right Sus Arm<1> (Full [in-use])
(-) 96-Rear Shock Tower<1>
(-) Camber Rod<2>
(-) Rear Shock<2> (Full [in-use])
(-) Rear Hub<2> (Full [in-use])
Annotations
Plane1
Plane2
Plane3
Origin
(-) 107-Hub Spacer<1>
(-) 107-Hub Spacer<2>
(-) 106-Hinge Pin<2> (Full)
(f) 103-Rear Hub<2> (Full)
MateGroup1
(-) 100-Rear Axle<2> (Full [in-use])
(-) 99-Universal Pivot<1> (Full [in-use])
(-) Half Shaft<1> (Full [in-use])
MateGroup1
208
204
206
Ready
Editing Assembly
Start
SolidWorks 2001 - [Re...
Camtasia Producer - Untit...
10:53 AM

Fig. 2

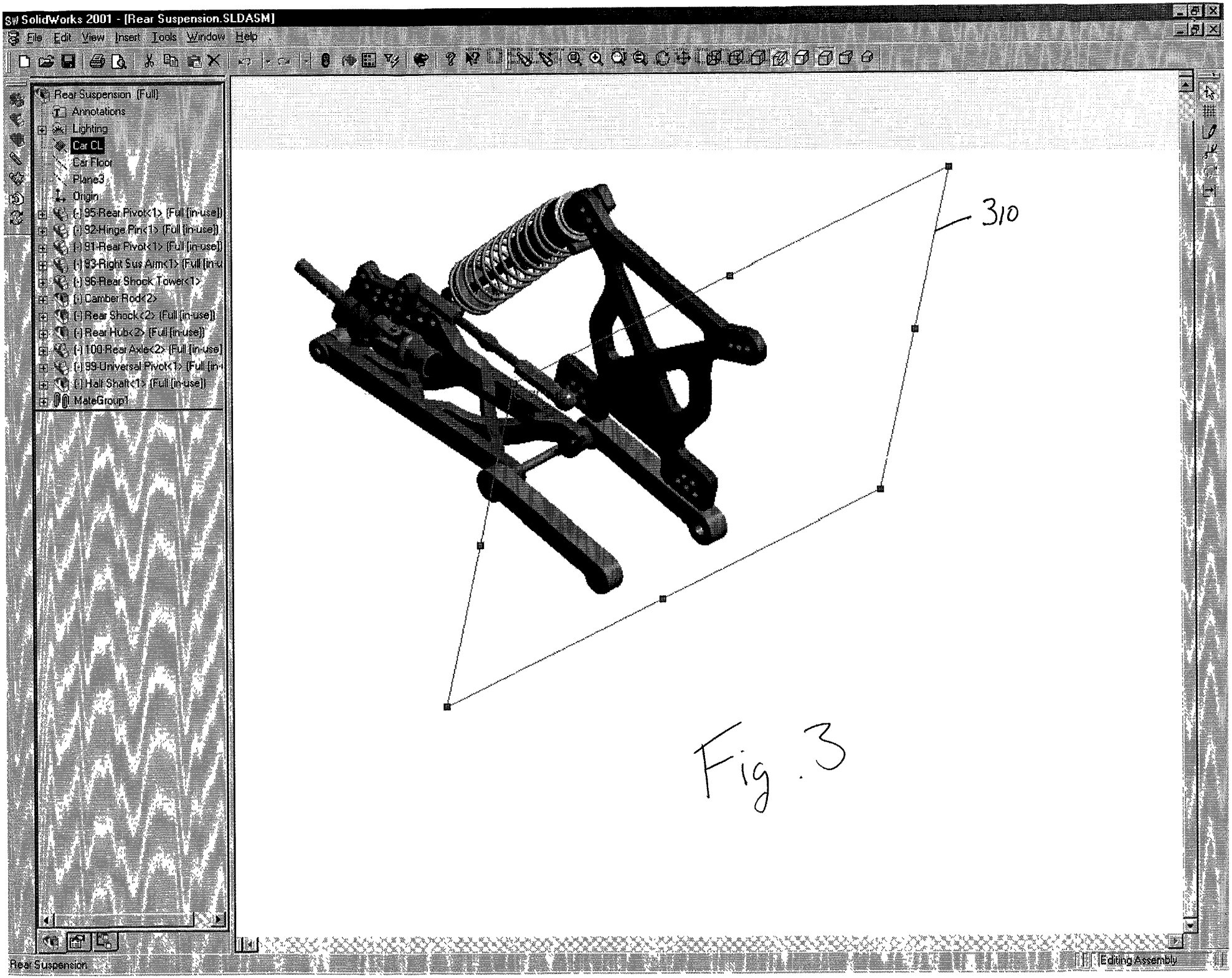

SolidWorks 2001 - [Rear Suspension.SLDASM]
File Edit View Insert Tools Window Help
Rear Suspension (Full)
Annotations
Lighting
Car CL
Car Floor
Plane3
Origin
(-) 95-Rear Pivot<1> (Full [in-use])
(-) 92-Hinge Pin<1> (Full [in-use])
(-) 91-Rear Pivot<1> (Full [in-use])
(-) 93-Right Sus Arm<1> (Full [in-u
(-) 96-Rear Shock Tower<1>
(-) Camber Rod<2>
(-) Rear Shock<2> (Full [in-use])
(-) Rear Hub<2> (Full [in-use])
(-) 100-Rear Axle<2> (Full [in-use]
(-) 99-Universal Pivot<1> (Full [in-
(-) Half Shaft<1> (Full [in-use])
MateGroup1
310
Rear Suspension
Editing Assembly

Fig. 3

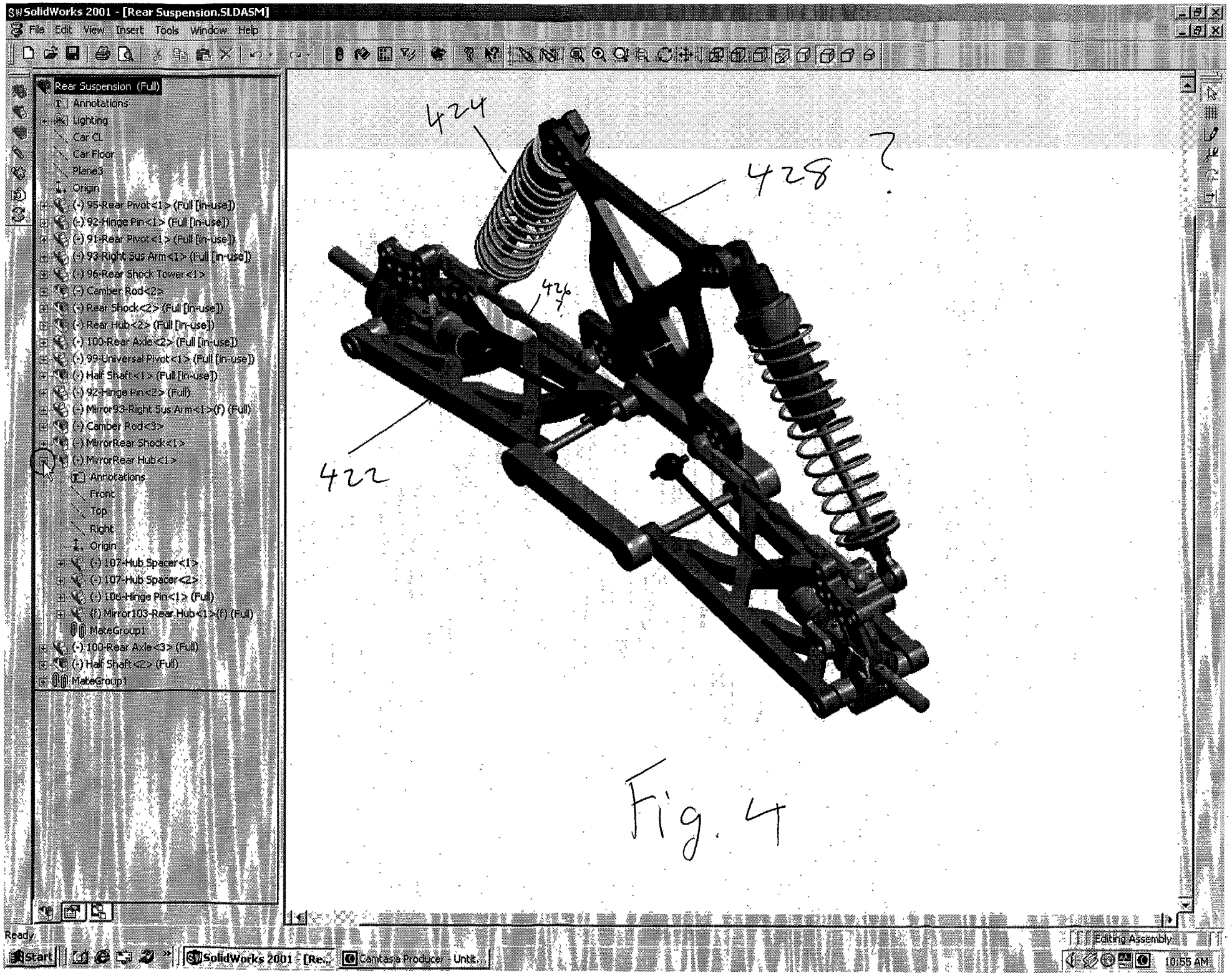

SolidWorks 2001 - [Rear Suspension.SLDASM]
File Edit View Insert Tools Window Help
Rear Suspension (Full)
Annotations
Lighting
Car CL
Car Floor
Plane3
Origin
(-) 95-Rear Pivot<1> (Full [in-use])
(-) 92-Hinge Pin<1> (Full [in-use])
(-) 91-Rear Pivot<1> (Full [in-use])
(-) 93-Right Sus Arm<1> (Full [in-use])
(-) 96-Rear Shock Tower<1>
(-) Camber Rod<2>
(-) Rear Shock<2> (Full [in-use])
(-) Rear Hub<2> (Full [in-use])
(-) 100-Rear Axle<2> (Full [in-use])
(-) 99-Universal Pivot<1> (Full [in-use])
(-) Half Shaft<1> (Full [in-use])
(-) 92-Hinge Pin<2> (Full)
(-) Mirror93-Right Sus Arm<1>(f) (Full)
(-) Camber Rod<3>
(-) MirrorRear Shock<1>
(-) MirrorRear Hub<1>
Annotations
Front
Top
Right
Origin
(-) 107-Hub Spacer<1>
(-) 107-Hub Spacer<2>
(-) 106-Hinge Pin<1> (Ful)
(f) Mirror103-Rear Hub<1>(f) (Full)
MateGroup1
(-) 100-Rear Axle<3> (Full)
(-) Half Shaft<2> (Full)
MateGroup1
424
428
426
422
Ready
Editing Assembly
Start
SolidWorks 2001 - [Re...
Camtasia Producer - Untit...
10:55 AM

Fig. 4

Attorney Docket No. 60035.0003US01

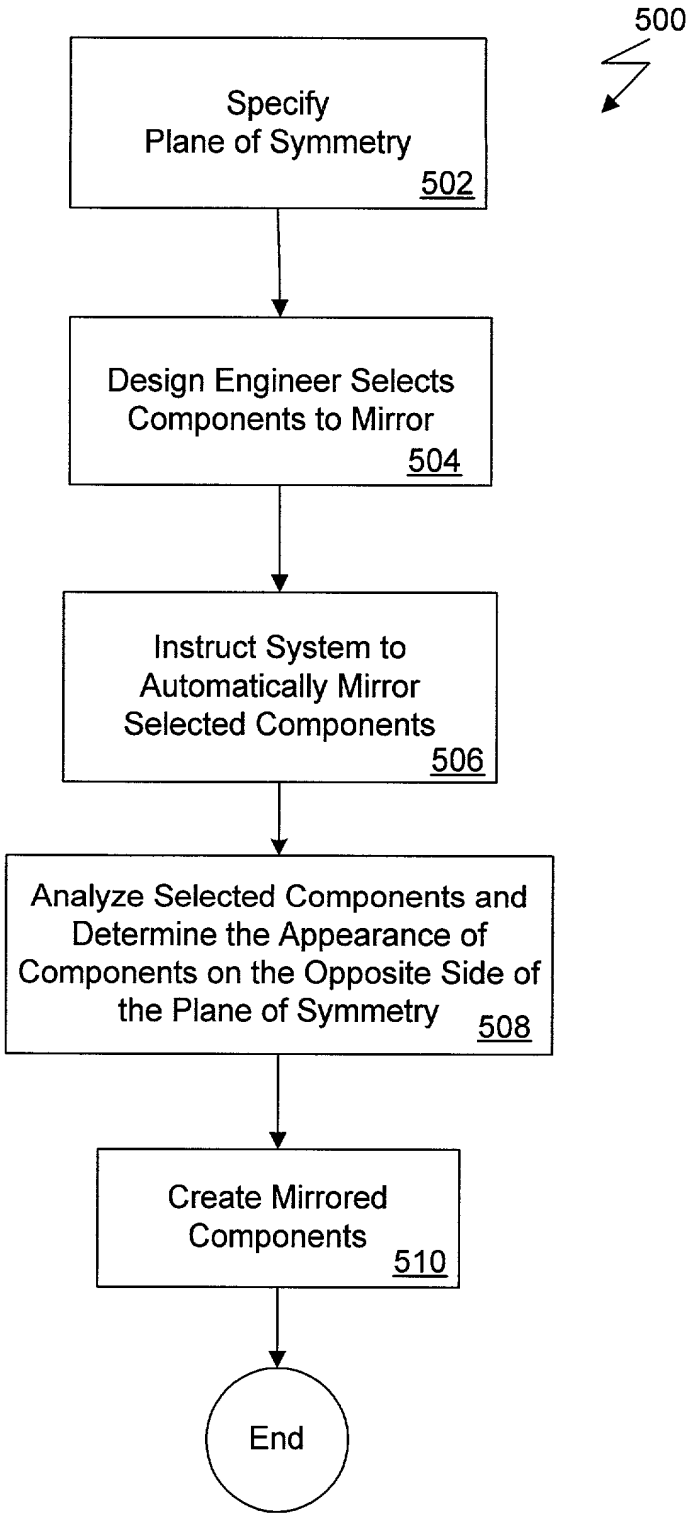


Fig. 5

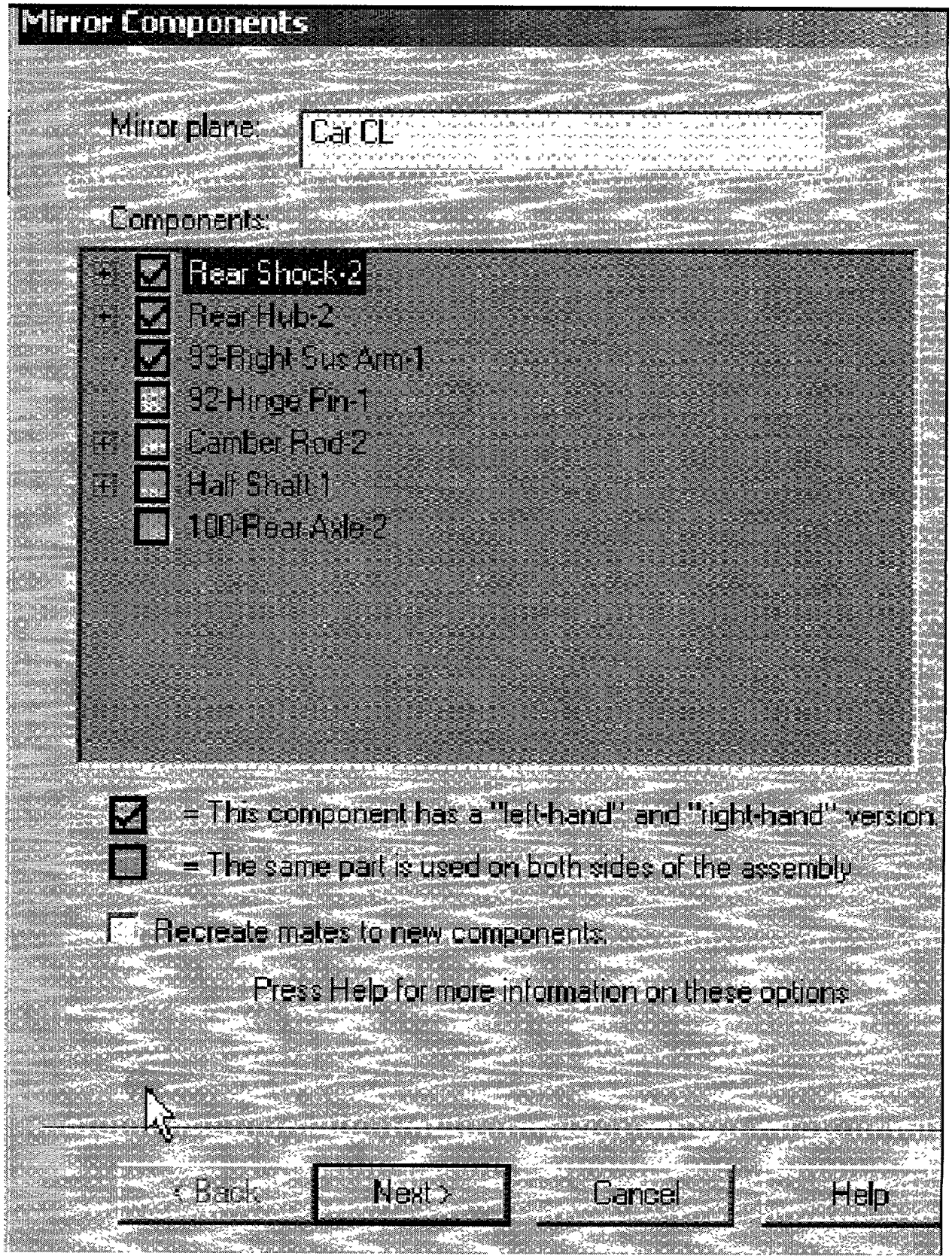
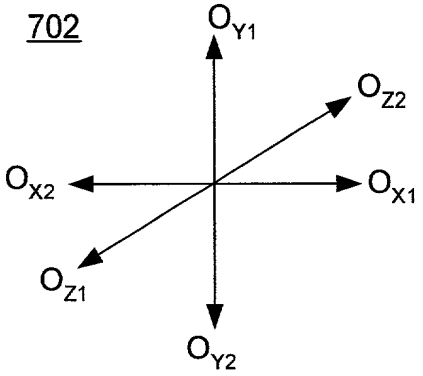
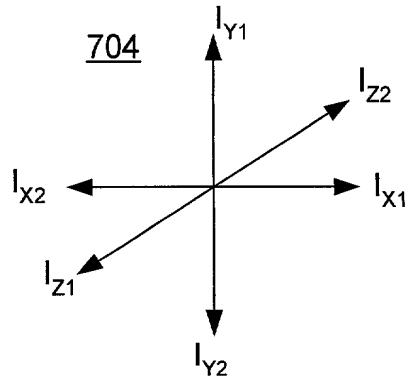
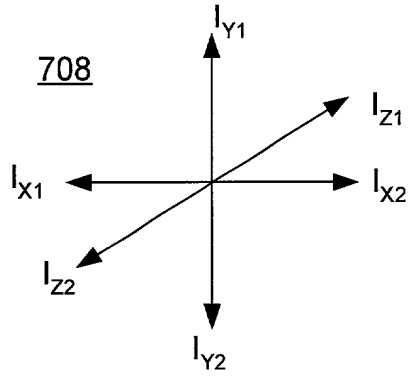

Mirror Components
Mirror plane:
Car CL
Components:
Rear Shock-2
Rear Hub-2
93-Right Sus Arm-1
92-Hinge Pin-1
Camber Rod-2
Half Shaft 1
100-Rear Axle-2
= This component has a "left-hand" and "right-hand" version
= The same part is used on both sides of the assembly
Recreate mates to new components.
Press Help for more information on these options
< Back
Next >
Cancel
Help

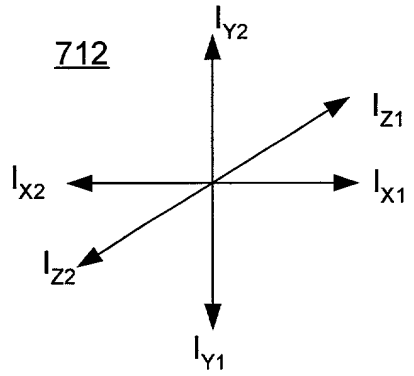
Fig. 6

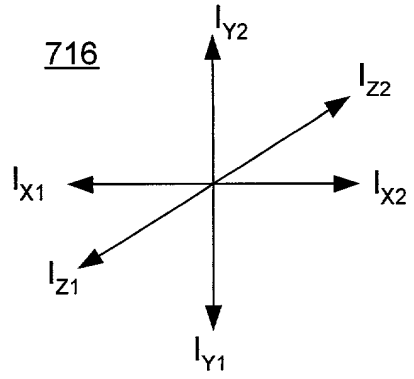
Fig. 7


702
O_{Y1}
O_{Z2}
O_{X2}
O_{X1}
O_{Z1}
O_{Y2}


704
I_{Y1}
I_{Z2}
I_{X2}
I_{X1}
I_{Z1}
I_{Y2}


708
I_{Y1}
I_{Z1}
I_{X1}
I_{X2}
I_{Z2}
I_{Y2}


712
I_{Y2}
I_{Z1}
I_{X2}
I_{X1}
I_{Z2}
I_{Y1}


716
I_{Y2}
I_{Z2}
I_{X1}
I_{X2}
I_{Z1}
I_{Y1}

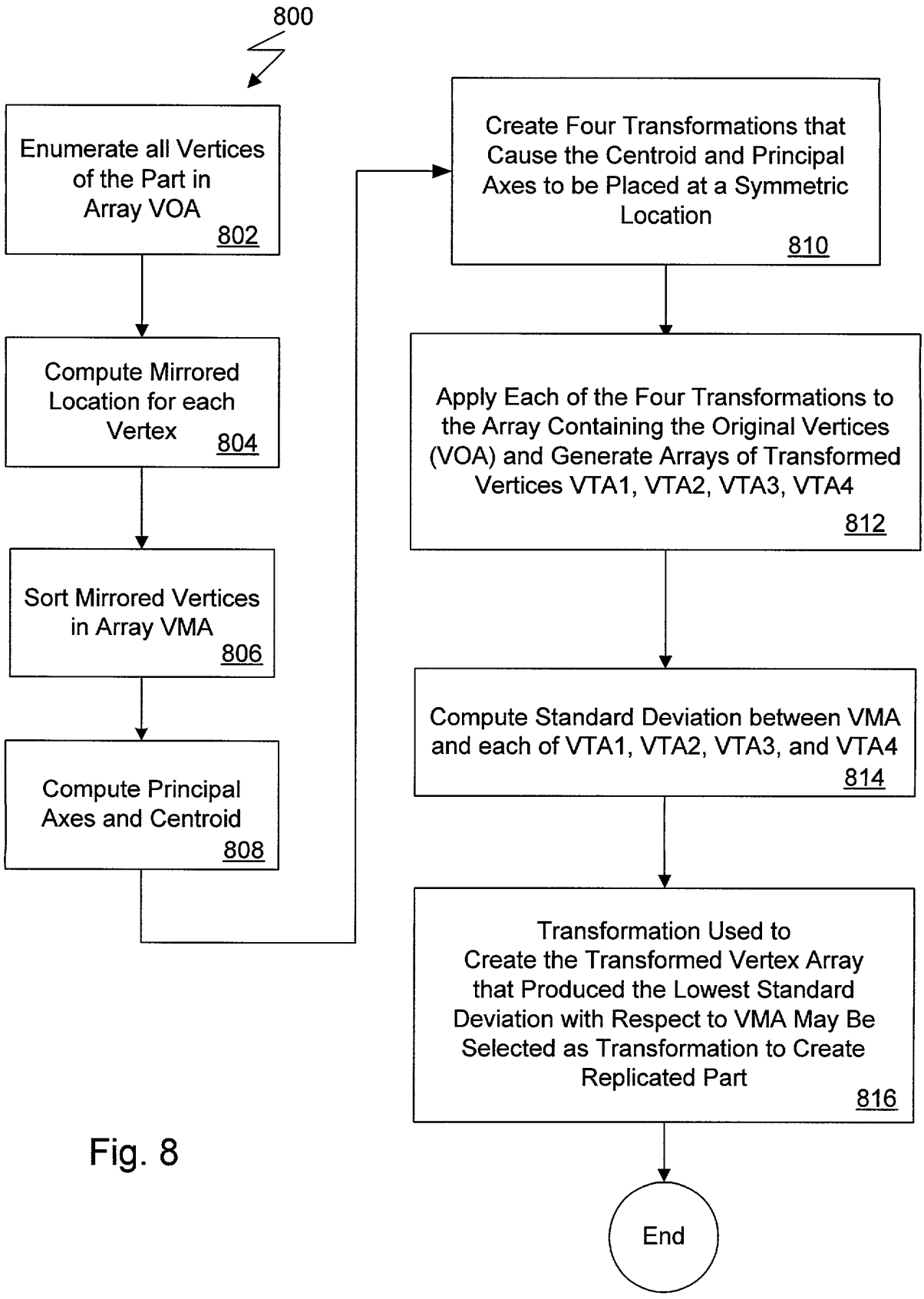

800
Enumerate all Vertices of the Part in Array VOA
802
Compute Mirrored Location for each Vertex
804
Sort Mirrored Vertices in Array VMA
806
Compute Principal Axes and Centroid
808
Create Four Transformations that Cause the Centroid and Principal Axes to be Placed at a Symmetric Location
810
Apply Each of the Four Transformations to the Array Containing the Original Vertices (VOA) and Generate Arrays of Transformed Vertices VTA1, VTA2, VTA3, VTA4
812
Compute Standard Deviation between VMA and each of VTA1, VTA2, VTA3, and VTA4
814
Transformation Used to Create the Transformed Vertex Array that Produced the Lowest Standard Deviation with Respect to VMA May Be Selected as Transformation to Create Replicated Part
816
End

Fig. 8

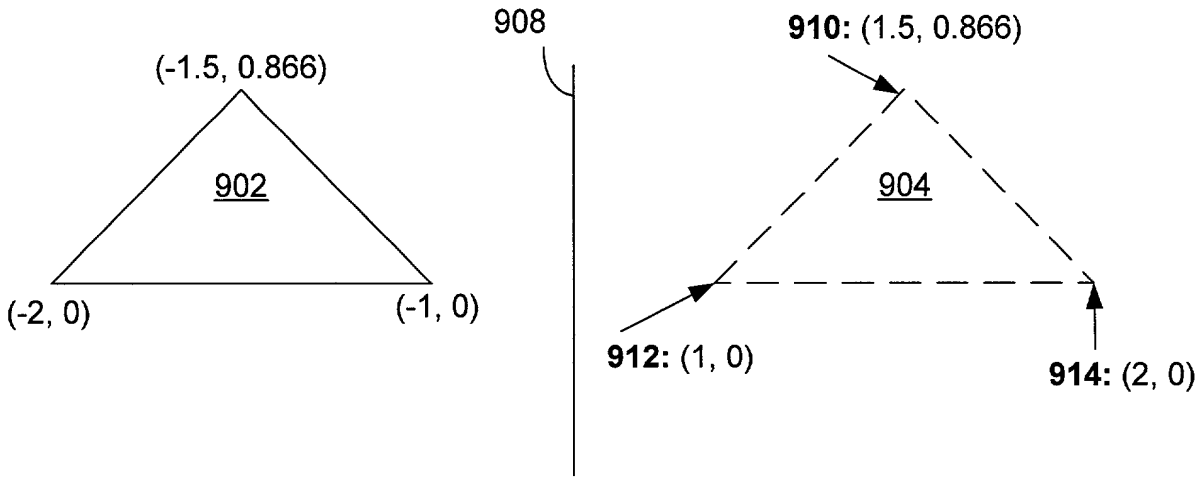

908
(-1.5, 0.866)
902
(-2, 0)
(-1, 0)
910: (1.5, 0.866)
904
912: (1, 0)
914: (2, 0)

Fig. 9a

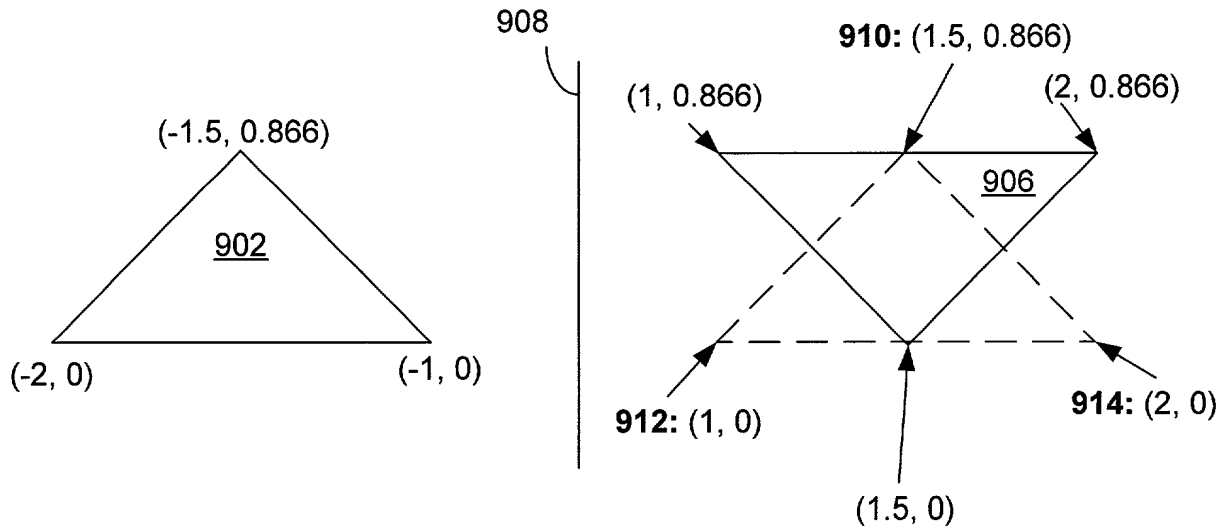

908
(-1.5, 0.866)
902
(-2, 0)
(-1, 0)
910: (1.5, 0.866)
(1, 0.866)
(2, 0.866)
906
912: (1, 0)
914: (2, 0)
(1.5, 0)

Fig. 9b

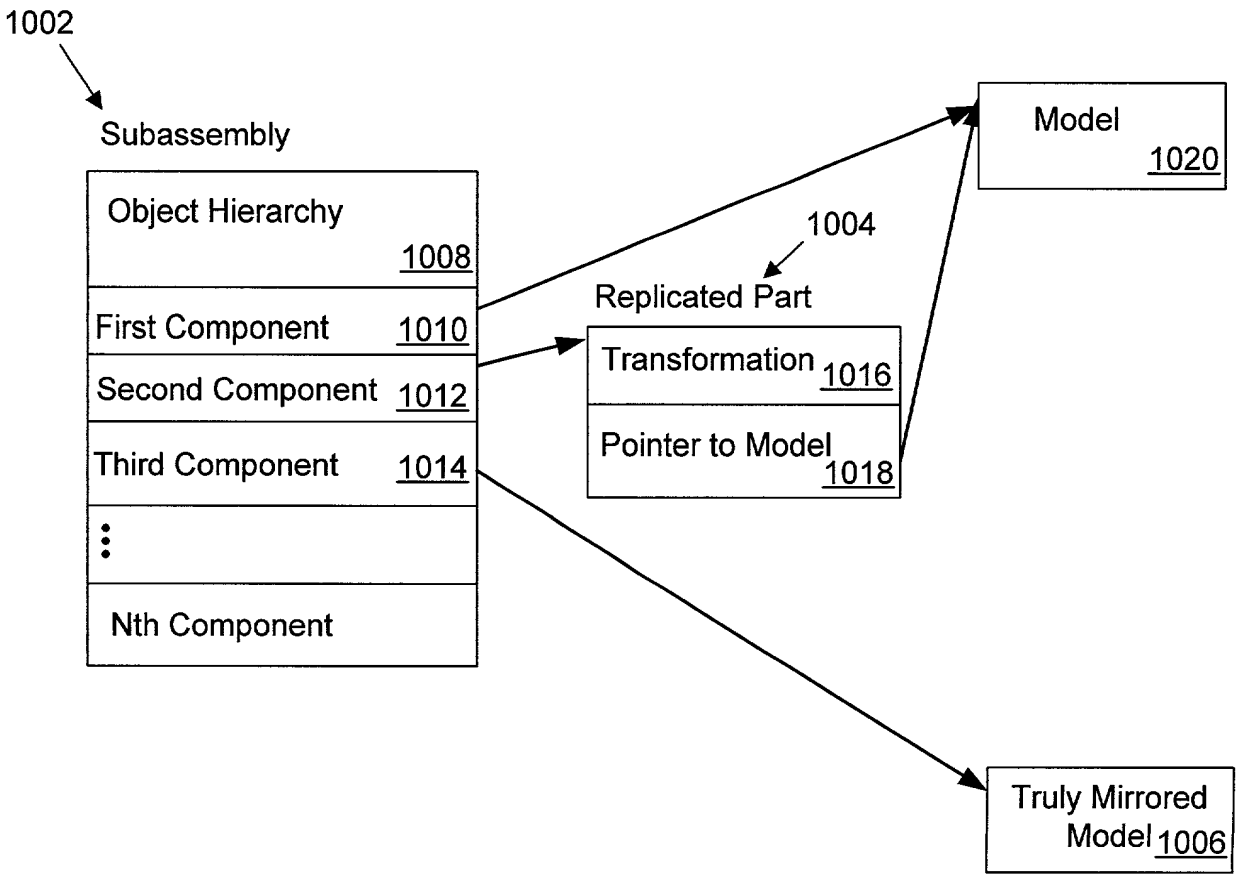

1002
Subassembly
Object Hierarchy
1008
First Component 1010
Second Component 1012
Third Component 1014
Nth Component
1004
Replicated Part
Transformation 1016
Pointer to Model 1018
Model
1020
Truly Mirrored Model 1006

FIG. 10

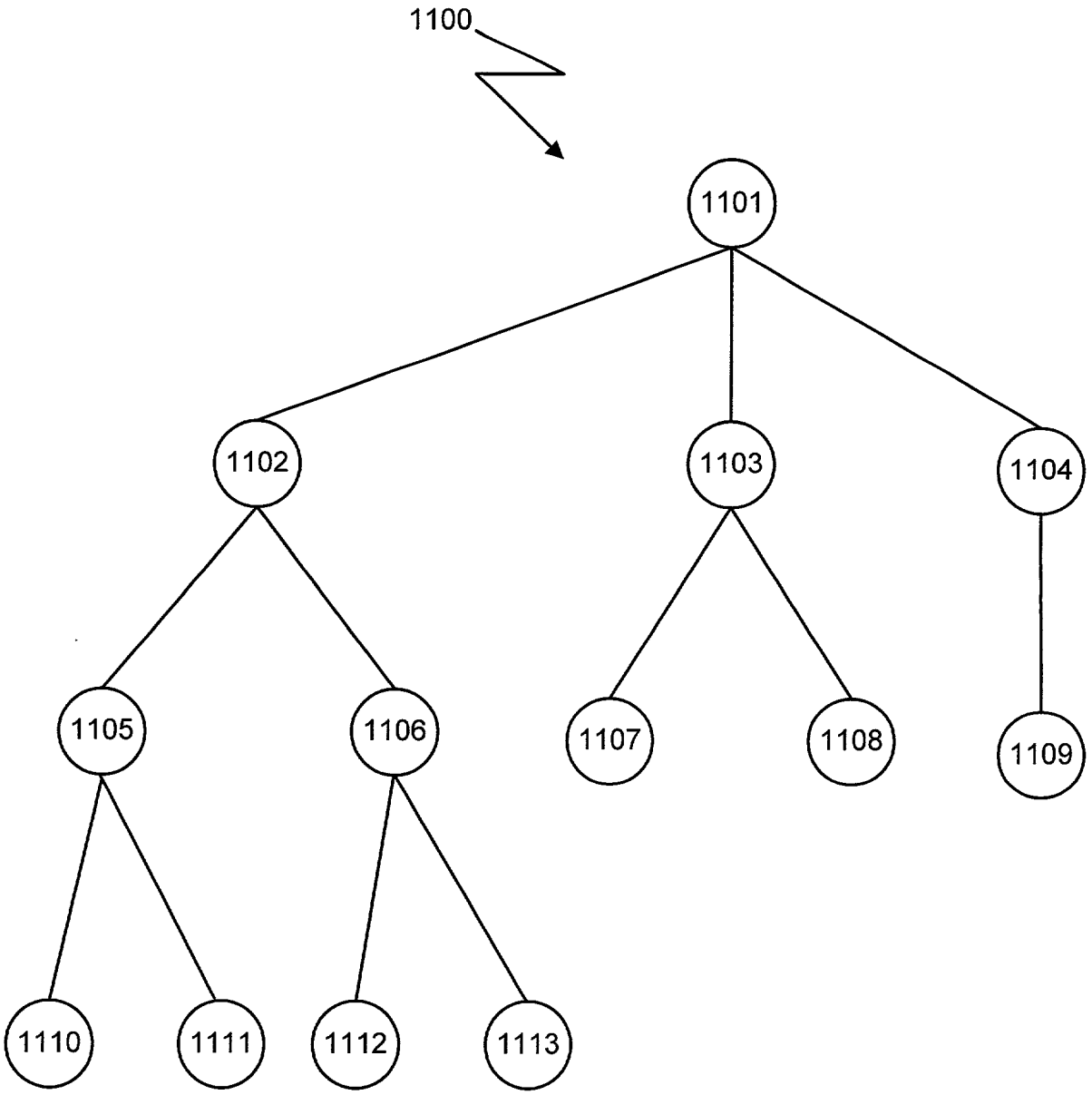

1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113

Fig. 11

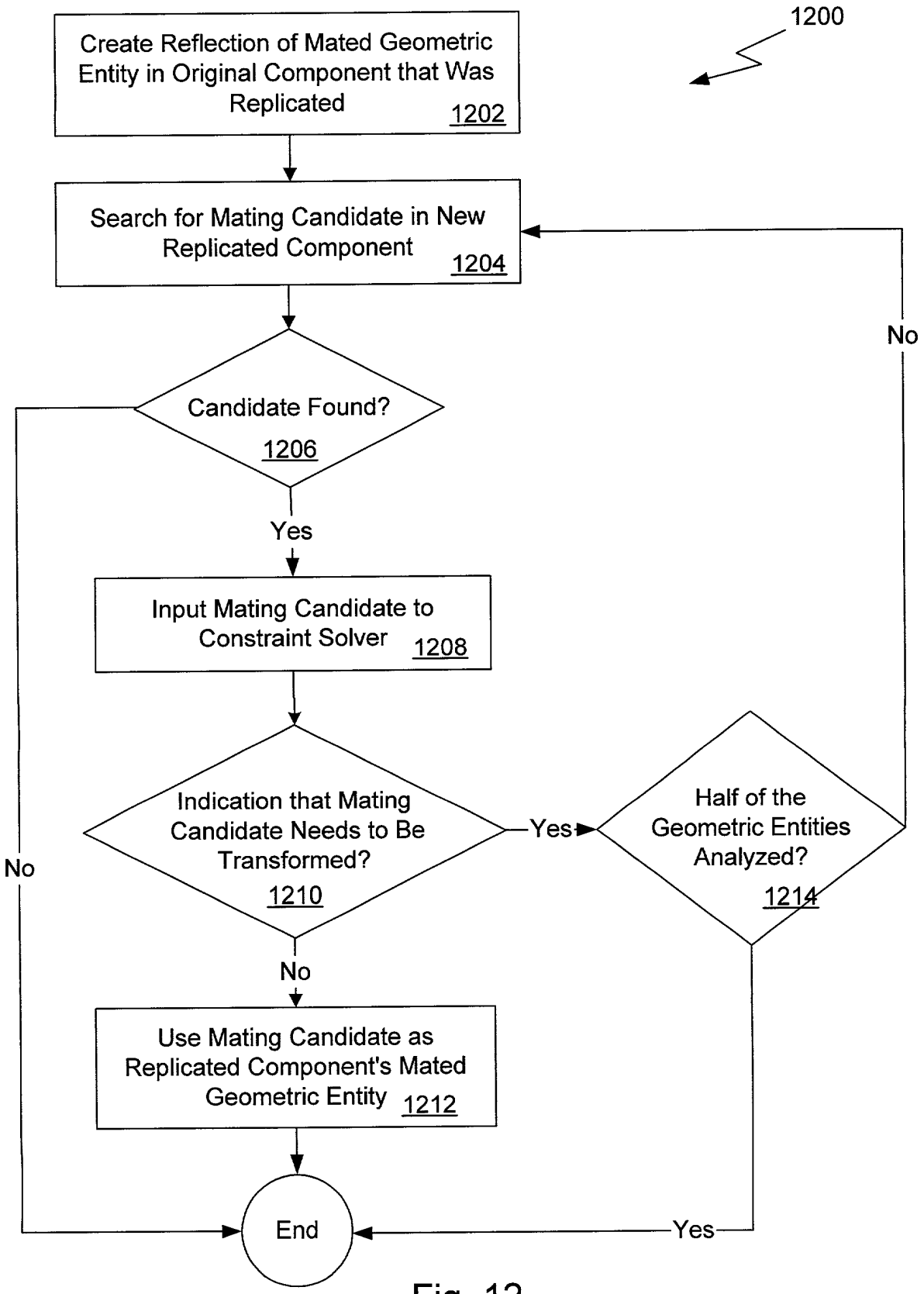

1200
Create Reflection of Mated Geometric Entity in Original Component that Was Replicated 1202
Search for Mating Candidate in New Replicated Component 1204
Candidate Found? 1206
No
Yes
Input Mating Candidate to Constraint Solver 1208
Indication that Mating Candidate Needs to Be Transformed? 1210
Yes
Half of the Geometric Entities Analyzed? 1214
No
No
Use Mating Candidate as Replicated Component's Mated Geometric Entity 1212
End
Yes

Fig. 12